Authority for Nuclear Safety and
Radiation Protection

National report for the Council Directive 2011/70/EURATOM

establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste

The Netherlands

Authority for Nuclear Safety and Radiation Protection

National report for the Council Directive 2011/70/EURATOM

establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste

The Netherlands

Date May, 2016

Abstract

This is the national report of the Kingdom of the Netherlands for the Council Directive 2011/70/EURATOM establishing a community framework for the safe management of spent fuel and radioactive wastes. The current report has been published in Dutch as well.

The report shows how the Netherlands meets the obligations of each of the articles of the Directive. Article 14.1 of the Directive requires Member States to report in a three-year cycle, on how they have implemented the obligations of the Directive. This report is the first in its series.

The report has been drafted in line with the guidance provided by the European Nuclear Safety Regulators Group ENSREG in their document '*Final Guidelines for MS Reports to the Waste Directive*', HLG_p(2014-27)_137.

The Netherlands will submit its national programme to the Commission in a separate document. The present national report refers in various sections to the national programme.

The Netherlands has established and maintains a national legislative, regulatory and organisational framework ('national framework') for spent fuel and radioactive waste management, which is part of the framework for nuclear safety and radiation protection. The current competent regulatory body for this subject is the Authority for Nuclear Safety and Radiation Protection[1], part of the Ministry of Infrastructure and the Environment.

The national policy on the management of spent fuel and radioactive waste is summarised below.

The Dutch policy aims at minimisation of waste production. Prevention, reuse and use of radioactive decay are important elements of this policy.

The prime responsibility for the safe management of spent fuel and radioactive waste rests with the waste producers (i.e. license holders); the license holders shall also bear the associated costs. In the Netherlands, COVRA is the central organisation for the management of spent fuel and radioactive waste. Every company in the Netherlands must hand over their radioactive waste to COVRA. At COVRA above-ground storage is available for at least 100 years, after which a final disposal is envisaged around 2130.The waste management shall be safe now and in the future. During storage at COVRA the waste is managed safely. For the future, a final disposal is envisaged. A dual-track policy presents the option of establishing a national geological disposal facility as well as the option of cooperating with one or more countries in the field of radioactive waste management (including disposal). The disposal facility shall have passive safety features and during the operational period of the disposal facility the waste shall be retrievable.

The radioactive waste policy should not put any undue burden for future generations. The generations that have benefitted from certain application of radioactivity shall also bear the costs of the management of the associated radioactive waste.

[1] Autoriteit Nucleaire Veiligheid en Stralingsbescherming, ANVS

List of symbols and abbreviations

Abbreviation	Full term in Dutch	Translation / explanation
ALARA		As Low As Reasonably Achievable
ANVS	Autoriteit Nuclear Veiligheid en Stralingsbescherming	Authority for Nuclear Safety and Radiation Protection
Awb	Algemene wet bestuursrecht	General Administrative Law Act
Bkse	Besluit kerninstallations, splijtstoffen en ertsen	Nuclear Installations, Fissionable Materials and Ores Decree
Bs	Besluit stralingsbescherming	Radiation Protection Decree
Bvser	Besluit vervoer splijtstoffen, ertsen en radioactieve stoffen	Transport of Fissionable Materials, Ores and Radioactive Materials Decree
COVRA	Centrale Organisatie voor Radioactief Afval	Central Organisation for Radioactive Waste
ENSREG		European Nuclear Safety Regulators Group
EPZ	NV Elektriciteits-Productiemaatschappij Zuid-Nederland	Operator of the nuclear power plant in Borssele
EU		European Union
GBq	Giga Becquerel	(Giga = 10^9)
GKN	Gemeenschappelijke Kernenergiecentrale Nederland	Operator of the nuclear power plant in Dodewaard

Abbreviation	Full term in Dutch	Translation / explanation
GRS		Gesellschaft für Anlagen- und Reaktorsicherheit; German service provider in the field of nuclear safety
HABOG	Hoogradioactief AfvalBehandelings- en Opslag Gebouw	High level Radioactive Waste Treatment and Storage Building
HFR	Hoge Flux Reactor	Research reactor in Petten, 45 MW_{th}
HOR	Hoger Onderwijs Reactor	Higher Education Reactor; research reactor at the University of Technology Delft, 3 MW_{th}
IAEA		International Atomic Energy Agency
I&M	Ministerie van Infrastructuur en Milieu	Dutch Ministry of Infrastructure and the Environment
Kew	Kernenergiewet	Nuclear Energy Act
MER	Milieu-effect rapport	Environmental Impact Report
MW_e		Megawatt electric
MW_{th}		Megawatt thermic
NEA		Nuclear Energy Agency (An agency of the OECD)
NRG		Nuclear Research and consultancy Group
NVR	Nucleaire Veiligheids-Richtlijn	Nuclear Safety Directive
OECD		Organisation for Economic Cooperation and Development

Abbreviation	Full term in Dutch	Translation / explanation
OPERA	OnderzoeksProgramma Eindberging Radioactief Afval	Research Programme into Disposal of Radioactive Waste
RID	Reactor Instituut Delft	Reactor Institute Delft (Operator of the Higher Education Reactor, HOR, in Delft)
RIVM	Rijksinstituut voor Volksgezond-heid en Milieuhygiëne	Dutch National Institute for Public Health and the Environment
TSO		Technical (safety) Support Organisation
URENCO		URanium ENrichment COrporation Ltd
WANO		World Association of Nuclear Operators
WENRA		Western European Nuclear Regulators Association
Wob	Wet openbaarheid van bestuur	General Information (Public Access) Act
ZBO	Zelfstandig BestuursOrgaan	Independent Non-Departmental Public Body

Contents

Introduction

This introduction explains among other points the purpose of the present report: '*National Report of the Kingdom of the Netherland for the Council Directive 2011/70/EURATOM*'. The introduction provides an overview of current and potential sources of spent fuel and radioactive waste. It provides a description of which Competent Authorities and implementing organisations are involved in the responsible and safe management of spent fuel and radioactive waste.

Purpose of the national rapport

The national rapport demonstrates how the Kingdom of the Netherlands complies with the obligations arising from Article 14 of the Council Directive 2011/70/EURATOM. Article 14.1 of the Directive obliges the Member States to submit a report to the European Commission on a three-yearly cycle on how they have implemented the obligations. This report is the first of the series of reports for the Directive.

This report was drawn up in accordance with the guidelines[2] of the 'European Nuclear Safety Regulators Group' (ENSREG).

Relationship between this national report and the 'national programme'

In addition to a national report on compliance with the above referred to Directive, all EU Member States are required to draw up a so-called national programme for the management of spent fuel and radioactive waste, in accordance with Article 11 of the Directive. In accordance with Article 13 of the Directive, the Member States must inform the European Commission of their national programmes.

It was envisaged to send both reports at the same time to the European Commission to avoid any inconsistencies that might arise, whenever the parliament likes to change the national programme. However, since the parliament still has the national programme on its agenda, it is not advisable to wait any longer with the submission of the national report to the European Commission.

Sources of spent fuel and radioactive waste in the Netherlands

The spent fuel and the radioactive waste are generated by licence holders (see 5.0.a.5). All companies in the Netherlands that hold a licence on the basis of the Nuclear Energy Act are required to tender their radioactive waste to COVRA.

The competent regulatory authority involved in the responsible and safe management of spent fuel and radioactive waste in the Netherlands

The Authority for Nuclear Safety and Radiation Protection (ANVS)[3], mandated by the Minister of Infrastructure and the Environment, is the competent regulatory body. The ANVS brings together expertise in the fields of nuclear safety and radiation protection, as well as security and safeguards. The ANVS has a staff of currently 122 FTE.

More information on the competent regulatory authority is available in the section accompanying ARTICLE 6 of this report.

Legal framework in respect of the safe management of spent fuel and radioactive waste in the Netherlands

The Nuclear Energy Act forms the basis for Dutch regulations in the field of nuclear safety and radiation protection and as such also for the management of spent fuel

[2] 'Final Guidelines for MS Reports to the Waste Directive', HLG_p(2014-27)_137, ENSREG, 2014
[3] Autoriteit Nucleaire Veiligheid en Stralingsbescherming, ANVS

and radioactive waste. The Nuclear Energy Act consists of approximately 100 articles. These articles contain the principles for further regulation, licensing systems and government authorities.

For more details about the legal framework, see the section accompanying ARTICLE 5 of this report and chapter 5 of the national programme of the Netherlands.

The policy in respect of the management of spent fuel and radioactive waste in the Netherlands

The policy in respect of the management of spent fuel and radioactive waste will be presented in the national programme on radioactive waste of the Netherlands[4]. Additional information on this subject is also available in this report, in particular in chapter 4.0. The policy is briefly summarised below.

Radioactive waste policy and links to other policy fields

The policy on radioactive waste is part of the policy on radiation protection, which protects man and the environment against the risks of exposure to ionising radiation. To achieve this, exposure to radiation must be justified, as low as reasonably achievable (ALARA) and must remain within specified thresholds. Anyone using ionising radiation bears prime responsibility for that use. The same principles are applied to the management of radioactive waste.

The policy applies a graded approach; the greater the risk, the stricter the regime. For example, the requirements imposed on activities involving spent fuel are stricter than for activities involving other radioactive substances.

The policy on radioactive waste ties in with the policy in respect of conventional waste. As far as possible, for example, the policy strives to close raw materials cycles, with priority to be given to the most environmentally friendly possible processing methods. In the policy on radioactive waste, the following preferred order for processing is also assumed: prevention, reuse, and finally safe management of remaining waste substances. Furthermore, as with conventional waste, for the management of radioactive waste, the IBC principle is applied: isolate, manage and control.

Reprocessing of spent fuel from the Nuclear power plant in Borssele

Government policy in respect of the reprocessing of spent fuel in principle leaves the choice of whether or not to reprocess to the operator of the nuclear power plant. In the past, operators of nuclear power plants in the Netherlands have opted for reprocessing.

Management of radioactive waste and spent fuel

For more than thirty years the Dutch policy on radioactive waste is based on a aboveground storage of radioactive waste at COVRA for at least a period of 100 years, after which disposal deep belowground is envisaged, around 2130. The policy will be described in detail in the national programme, which is submitted for discussion to the parliament.

The practice of the management of spent fuel and radioactive waste in the Netherlands and the implementing organisations

All the radioactive waste and the spent fuel from research reactors is stored in the aboveground facilities for interim storage during this century at the Central Organisation For Radioactive waste, COVRA. As a result, nuclear installations do not have their own (long-term) waste storage facilities. COVRA is the only organisation in the Netherlands with a licence to store waste.

The operator of the nuclear power plant in Borssele has entered into reprocessing contracts for all spent fuel which will be produced up to the end of the operating

[4] In the national programme for 2016, see chapters 4 (policy) and 5 (legislation and regulation).

period of the power plant. In 2012, the Republic of France and the Kingdom of the Netherlands signed a treaty that regulates the reception and reprocessing of Dutch spent fuel by Areva NC in France, and the return to the Netherlands[5] of the radioactive residues from reprocessing.

Spent fuel from the research reactors will not be reprocessed, but will be transported to COVRA.

The COVRA site occupies approximately 25 hectares. On this site, COVRA has various waste processing and storage facilities for radioactive waste and spent fuel. The 'HABOG facility' was built for the storage of spent fuel, residues from reprocessing of spent fuel (vitrified waste and compacted caps and hulls of spent fuel elements) and used uranium targets from molybdenum production. The building is resistant to the most extreme conceivable external occurrences. It is a modular storage building with a passive cooling system.

COVRA offers the possibility to store materials that need longer than two years[6] to decay to below the release thresholds (decay storage). During a period of not more than 25 years, materials from the dismantling of large fixed installations can be stored at COVRA without being reprocessed.

More details of waste management and the other tasks of COVRA are available in the national programme of the Netherlands.

Key issues in respect of the management of spent fuel and radioactive waste and safety in this report

- About thirty years ago the Netherlands has opted for a single central organisation for the management of all spent fuel and radioactive waste; this organisation is COVRA. The aboveground storage at COVRA has been built for at least 100 years, after which for the time being, disposal is envisaged;
- The key elements of the policy are:
  - In the first instance, the waste producers are responsible for the responsible management of their waste and the related costs.
  - The policy is aimed at minimising the waste flows. Prevention of waste production, reuse and using radioactive decay are successful policy instruments.
  - Safe management now and in the future is a key element. During aboveground storage at COVRA, the waste is safely managed. In the future, for the moment geological disposal is envisaged in a disposal facility which must be passively safe. During the operation of the facility the waste must be retrievable.
  - There may be no unreasonable burdens on future generations. The generations that have profited from specific applications of radioactivity must bear the burdens for the costs of management of the resultant waste.

Most recent peer review and planned reviews

The competent regulatory authority recently (2013-2014) undertook a major self-assessment in the framework of an IRRS mission of the IAEA, which was concluded in 2014. A follow-up mission is foreseen in 2018. For more information see section 5.2.d of this report.

Procedure for establishment of the national report

This National Report was drawn up by the ANVS together with the national programme. The drawing up of this report involved persons who were active in drawing up the national programme.

[5] before the end of 2052

[6] This is a period during which the licence holder is permitted to store waste materials with a half-life of not more than 100 days at its own facilities, to allow that waste to decay to non-radioactive waste.

It was envisaged to send both reports at the same timer to the European Commission to avoid any inconsistencies that might arise, whenever the parliament likes to change the national programme. However, since the parliament still has the national programme on its agenda, it is not advisable to wait any longer with the submission of the national report to the European Commission.

Reading this document

This report follows the structure proposed by ENSREG.

Wherever in this report the term 'Directive' is used, this refers to the Council Directive 2011/70/EURATOM.

Wherever the term 'Netherlands' is used, this refers to the 'Kingdom of the Netherlands'.

Summary

Updated information about issues that have developed since the publication of the previous national report

Not applicable; this is the first national report.

Important issues identified in the previous report or which have occurred since publication of the previous report.

Not applicable; this is the first national report.

ARTICLE 4. **General principles**

This chapter deals with the policy measures for complying with the obligations from Article 4 of the Directive, as applicable today to spent fuel and radioactive waste. For certain aspects, the text below refers to the Introduction to the present report.

4.0 Text of the Article

Article 4 – General principles

4.1. Member States shall establish and maintain national policies on spent fuel and radioactive waste management. Without prejudice to Article 2(3), each Member State shall have ultimate responsibility for management of the spent fuel and radioactive waste generated in it.

4.2. Where radioactive waste or spent fuel is shipped for processing or reprocessing to a Member State or a third country, the ultimate responsibility for the safe and responsible disposal of those materials, including any waste as a by-product, shall remain with the Member State or third country from which the radioactive material was shipped.

4.3. National policy shall be based on all of the following principles:

a) the generation of radioactive waste shall be kept to the minimum which is reasonably practicable, both in terms of activity and volume, by means of appropriate design measures and of operating and decommissioning practices, including the recycling and reuse of materials;

b) the interdependencies between all steps in spent fuel and radioactive waste generation and management shall be taken into account;

c) spent fuel and radioactive waste shall be safely managed, including in the long term with passive safety features;

d) implementation of measures shall follow a graded approach;

e) the costs for the management of spent fuel and radioactive waste shall be borne by those who generated those materials;

f) an evidence-based and documented decision-making process shall be applied with regard to all stages of the management of spent fuel and radioactive waste.

4.4. Radioactive waste shall be disposed of in the Member State in which it was generated, unless at the time of shipment an agreement, taking into account the criteria established by the Commission in accordance with Article 16(2) of Directive 2006/117/Euratom, has entered into force between the Member State concerned and another Member State or a third country to use a disposal facility in one of them.

Prior to a shipment to a third country, the exporting Member State shall inform the Commission of the content of any such agreement and take reasonable measures to be assured that:

a. the country of destination has concluded an agreement with the Community covering spent fuel and radioactive waste management or is a party to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management ('the Joint Convention');

b. the country of destination has radioactive waste management and disposal programmes with objectives representing a high level of safety equivalent to those established by this Directive; and

c. the disposal facility in the country of destination is authorised for the radioactive waste to be shipped, is operating prior to the shipment, and is managed in accordance with the requirements set down in the radioactive waste management and disposal programme of that country of destination.

4.0.a Statements about the national policy of the Kingdom of the Netherlands in relation to Article 4 of the Directive

The Netherlands has implemented the Directive in national legislation. In accordance with the Directive, the Netherlands bears ultimate responsibility for the management of spent fuel and radioactive waste. This responsibility includes the conditions as formulated in articles 4.2 and 4.4 of the Directive.

The national policy of the Netherlands in respect of the management of spent fuel and radioactive waste is based on the principles as formulated in Article 4.3 of the Directive.

The national policy of the Netherlands provides for management options and definitive disposal facilities for all radioactive waste flows.

4.0.b Political decisions in relation to Article 4 of the Directive, that form the basis for the national policy

As specified in the Introduction to this report, the national policy has undergone little change over the past 30 years, and complies with the requirements of Article 4. Directive 2011/70/Euratom has been fully implemented in the Radiation Protection Decree (Article 20h) and in the Nuclear Installations, Fissionable Materials and Ores Decree (Article 40a).

The political decisions that form the basis for the national policy – as previously outlined – were not taken recently. Nonetheless, with the introduction of Directive 2011/70/Euratom, every Member State has among other things been required to draw up a national programme. The national programme describes the current state of affairs in respect of Dutch policy on the management of radioactive waste, including disposal. In the programme, submitted to the Senate and the House of Representatives, proposals have been made for additions to the policy. Most of the additions were already notified to the House of Representatives in the past[7]. See chapters 2 and 4 of the national programme of the Netherlands. Publication of the Programme is foreseen shortly after the debate with the House of Representatives (originally scheduled for April 2016 but postponed).

[7] Parliamentary papers, session year 2012-2013, 25 422, no. 105

ARTICLE 5. **National framework**

This chapter describes the national statutory, regulatory and organisational framework for the management of spent fuel and radioactive waste.

5.0 Text of the Article and introductory explanations

Article 5 – National framework

5.1. Member States shall establish and maintain a national legislative, regulatory and organisational framework ('national framework') for spent fuel and radioactive waste management that allocates responsibility and provides for coordination between relevant competent bodies. The national framework shall provide for all of the following:

a. a national programme for the implementation of spent fuel and radioactive waste management policy;

b. national arrangements for the safety of spent fuel and radioactive waste management. The determination of how those arrangements are to be adopted and through which instrument they are to be applied rests within the competence of the Member States;

c. a system of licensing of spent fuel and radioactive waste management activities, facilities or both, including the prohibition of spent fuel or radioactive waste management activities, of the operation of a spent fuel or radioactive waste management facility without a licence or both and, if appropriate, prescribing conditions for further management of the activity, facility or both;

d. a system of appropriate control, a management system, regulatory inspections, documentation and reporting obligations for radioactive waste and spent fuel management activities, facilities or both, including appropriate measures for the post-closure periods of disposal facilities;

e. enforcement actions, including the suspension of activities and the modification, expiration or revocation of a licence together with requirements, if appropriate, for alternative solutions that lead to improved safety;

f. the allocation of responsibility to the bodies involved in the different steps of spent fuel and radioactive waste management; in particular, the national framework shall give primary responsibility for the spent fuel and radioactive waste to their generators or, under specific circumstances, to a licence holder to whom this responsibility has been entrusted by competent bodies;

g. national requirements for public information and participation;

h. the financing scheme(s) for spent fuel and radioactive waste management in accordance with Article 9.

5.2. Member States shall ensure that the national framework is improved where appropriate, taking into account operating experience, insights gained from the decision-making process referred to in Article 4(3)(f), and the development of relevant technology and research.

5.0.a Overview of the national framework of legislation and organisation relating to the management of spent fuel and radioactive waste

5.0.a.1 Legislation and regulations

The Nuclear Energy Act[8] is the basis of Dutch regulations in respect of nuclear safety and radiation protection, and as such for the management of spent fuel and radioactive waste. In the articles of the Act, the principles for further regulation, licensing systems and the authorities of government are laid down.

For the management of spent fuel and radioactive waste, the following governmental decrees, in particular, are relevant:

- the Radiation Protection Decree (Bs): this lays down the most important rules for handling radioactive waste substances;
- the Nuclear Installations, Fissionable Materials and Ores Decree (Bkse): this lists the most important rules for handling spent fuel;
- the Transport of Fissionable Materials, Ores and Radioactive Substances Decree (Bvser): this Decree regulates the transport of spent fuel and radioactive waste.

Other relevant arrangements:

- the Decree on Import, Export and Transit of Radioactive Waste Materials and Irradiated Fission Materials
- Radioactive Contaminated Scrap Detection Regulation
- Shutdown and Decommissioning of Nuclear Facilities Regulation

As a Member State of the European Union, the Netherlands is required to implement in its national regulations the Directives that are established in consultation with other Member States. As a consequence, Directive 2011/70/Euratom has been implemented in the Radiation Protection Decree[9] (Article 20h) and the Nuclear Installations, Fissionable Materials and Ores Decree[10] (Article 40a).

5.0.a.2 Licences

The Nuclear Energy Act also operates a number of licensing systems. There are separate licences for maintaining a nuclear facility in operation, carrying out activities involving a radioactive substance, the use of a device or the transport of spent fuels or a radioactive substance. Characteristic of the requirements in a licence is that they are specifically directed at the licence holder. As a result, if necessary, a tailor-made application can be implemented.

5.0.a.3 Competent regulatory authority – policy, licensing, supervision, enforcement

Formally the minister of Infrastructure and the Environment (I&M) is the competent regulatory authority. The 'Authority for Nuclear Safety and Radiation Protection' (ANVS) has been mandated by the minister of I&M to implement the tasks of the competent regulatory authority. The ANVS is currently a directorate of the Ministry of I&M. Since the House of Representatives as well as the Senate in April 2016 approved the Bill[11], it is envisaged that in 2017 the ANVS will operate as a legally Independent Non-Departmental Public Body (in Dutch ZBO) with its own authorities, following implementation of the Bill to amend current legislation.

As a regulatory body the ANVS combines expertise in the fields of nuclear safety and radiation protection, as well as security and safeguards. For each of these subjects, the ANVS is focused on preparing policy, legislation and regulations, the awarding of

[8] http://english.autoriteitnvs.nl/documents/publication/2012/10/8/nuclear-energy-act
[9] Article 20h, http://english.autoriteitnvs.nl/documents/publication/2014/1/21/radiation-protection-decree
[10] http://english.autoriteitnvs.nl/documents/publication/2014/5/16/nuclear-facilities-fissionable-materials-and-ores-decree
[11] House of Representatives, session year 2014 – 2015, 34 219, no. 2 'Amendment to the Nuclear Energy Act in connection with the appointment of the Authority for Nuclear Safety and Radiation Protection – No. 2 White Paper'

licences, supervision and enforcement and (public) information. The ANVS contributes to safety studies and ensures that the Netherlands is well prepared for any radiation incidents. The ANVS has a staff of currently 122 FTE.

The ANVS in its current form became operational on 1 January 2015. Prior to that date, the tasks of the competent regulatory authority were implemented by a number of different entities, spread across various Ministries and operating jointly.

The work of the ANVS is subject to the Ministerial responsibility of the Minister of I&M. The Minister is accountable to the Parliament.

For more information about the competent regulatory authority and the ANVS, consult the section accompanying ARTICLE 6 of this report.

5.0.a.4 Collection and management of radioactive waste – the COVRA

The Central Organisation For Radioactive waste, COVRA, was already introduced in the Introduction to this report. It is the sole organisation in the Netherlands with a licence for the collection and storage of spent fuel and radioactive waste.

Only very low level radioactive waste (ZELA) is not stored at COVRA, but may be disposed of at specified landfill sites, or reused. Certain classes of naturally occurring radioactive materials (NORM[12]) are eligible for this use.

100% of the shares in COVRA are held by the State.

COVRA is required to reserve and manage financial resources for both long-term aboveground storage and for the implementation of (geological) disposal of the waste. At present, COVRA also coordinates a research programme about a safe final disposal.

5.0.a.5 Generators of spent fuel and radioactive waste – the licence holders

In the Netherlands, there are approximately 1300 licence holders with a licence according to the Nuclear Energy Act (Kew). Approximately two thirds of these produce or will produce radioactive waste in the future[13]. The waste produced can be divided into six sectors: nuclear, industry, medical, NORM industry, research and miscellaneous.

Nuclear facilities in the Netherlands that produce radioactive waste are:

- the nuclear power reactor of the Elektriciteits Produktiemaatschappij Zuid-Nederland (EPZ) in Borssele (485 MWe);
- the research reactors in Petten and Delft:
  - High Flux Reactor (HFR, 45 MW_{th}) of the Nuclear Research & Consultancy Group (NRG) in Petten. The HFR produces approximately 30% of all medical isotopes in the world. Using these isotopes, 24,000 patients are treated ever day;
  - Higher Education Reactor (HOR, 3 MW_{th}) at the University of Technology in Delft. The HOR is used for research and educational purposes;
- the uranium enrichment plant operated by URENCO in Almelo (6200 tSW/year).

There are two decommissioned nuclear installations: the nuclear power reactor (GKN, 60 MWe) in Dodewaard and the Low Flux Reactor (LFR, 30 kWth) operated by NRG in Petten. No radioactive waste is produced at these installations, but radioactive waste will arise when these installations are dismantled.

The research location in Petten has so called ‘historical waste’ in the storage building. This relates to the dry storage of waste from past experiments, still to be conditioned.

[12] Naturally Occurring Radioactive Materials (NORM)

[13] For example upon termination of the activities of a licence holder and demolition and/or remediation of its facilities.

5.0.b Ratification of relevant international conventions and other legal instruments

The Netherlands is party to many Treaties and Conventions relating to the use of nuclear technology and radioactive materials. This is illustrated by the following list.

- *Non-proliferation*: The Netherlands is party to the 'Treaty on the Non-Proliferation of Nuclear Weapons' (NPT), the non-proliferation treaty of the UN. Related to this are the guidelines from the 'Nuclear Suppliers Group' that lay down restrictions on the transfer of sensitive nuclear techniques such as enrichment and reprocessing. In addition, the Netherlands is affiliated to the 'Proliferation Security Initiative' (PSI), based on Resolution 1540 of the UN Security Council for the Non-proliferation of Weapons of Mass Destruction[14].
- *Liability*[15]: The Netherlands is party to a series of UN Treaties on liability, including the Paris Convention[16] and supplementing convention to the Convention of Paris, established in Brussels, and the joint protocol concerning the application of the Vienna Convention and the Paris Convention.
- *Nuclear safety*: The Netherlands is party to the UN Convention on Nuclear Safety[17].
- *(Radioactive) Waste management*: The Netherlands is party to the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive waste management[18].
- *Physical protection*: The Netherlands is party to the Convention on Physical Protection of Nuclear Material and Nuclear Installations[19].

The Netherlands has also expressed its support for the following 'Codes of Conduct':

- 'Code of Conduct on Safety and Security of Sources' (published 2004, IAEA)
- 'Code of Conduct on the Safety of Research Reactors' (published 2004, IAEA)

5.1 Preparing and maintaining a national framework

5.1.a National programme for the implementation of the policy on the management of spent fuel and radioactive waste – provisions in a legal framework

According to articles 11 and 12 of the Council directive 2011/70/Euratom a national programme has been drafted. About the draft the public has been consulted as well as the Netherlands Commission for Environmental Assessment. The redraft has been approved by the Council of Ministers and subsequently the concept has been submitted to the Parliament.

This section does not provide a description of the content of the national programme. This legal framework with its provisions relating to the implementation of the national policy via a national programme is already described in section 5.0.a.

The Netherlands will submit the national programme to the Commission and make public that same programme. More information about the national programme is available in this report in the sections relating to Articles 11 and 12 of the Directive.

5.1.b National arrangements for the safety of the management of spent fuel and radioactive waste

This section explains:

[14] UN Security Council Resolution 1540 (UNSCR 1540) for the non-proliferation of Weapons of Mass Destruction (WMD)
[15] Liability
[16] 'Paris Convention on Third Party Liability in the Field of Nuclear Energy'
[17] Convention on Nuclear Safety (CNS)
[18] Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, (JC)
[19] Convention on Physical Protection of Nuclear Material and Nuclear Installations

1. the process of establishing arrangements (including legislation), including the responsibilities of the various authorities and participation by interested members of the public in this process;
2. the various instruments for implementation of the arrangements.

5.1.b.1 Process of establishing arrangements such as laws and requirements

The Constitution of the Netherlands describes how laws are established, and how the Constitution itself can be amended. The members of the Senate and the House of Representatives together form the Parliament, and monitor the work of the Government.

The Government consists of the King, the Prime Minister, the other Ministers and the Secretaries of State. The Cabinet consists of the Government, without the King. The Government is accountable for its policy to Parliament.

The national legal framework consists of laws, governmental decrees and Ministerial Decrees. In as much as this legal framework concerns nuclear safety, radiation protection or related subjects, new or updated elements therefore are prepared by the competent regulatory authority, the ANVS. For more information about the position of the ANVS, see the section in this report about ARTICLE 6 of the Directive.

The majority of laws are introduced to the Parliament by the Government. The members of Parliament can adopt, reject or amend a Bill. Certain laws such as the Nuclear Energy Act are a so-called 'framework act' whereby the establishment of the underlying detailed requirements is delegated to Ministers or specific administrative bodies.

The Advisory Division of the Council of State provides the Government with independent advice on proposals for new regulations. During the procedure of legislation and regulation, the competent regulatory body involves the relevant actors such as licence holders, non-governmental organisations (NGOs) and public in this process. For national arrangements for and the practice of participation by the public, see section 5.1.g below.

Since 2014 an advisory referendum among the public has to be hold on every legal proposal whenever the required number of signatures has been gathered . Above a turnout of 30 % the referendum is valid and the government has to respond.

5.1.b.2 The diverse instruments for implementing arrangements

The Directive 2011/70/Euratom is fully implemented in the national regulations in the Netherlands, and the relevant details need not be reported in this report.

Below, the legal framework will be briefly explained in more detail.

As outlined above, there are laws and underlying regulations. Section 5.0.a.1 has already listed the most important elements, in so far as they are linked to the Nuclear Energy Act. In addition, there are other Ministerial regulations, the preparation of which is delegated to a Minister. These regulations are not submitted to Parliament for a vote. However, a so-called 'preliminary scrutiny procedure' is employed for Ministerial Decrees (Amvb's) whereby Parliament is offered an additional opportunity for exercising control. After approval and before a decree enters into force the House of Representatives has a period of 4 weeks to make additional remarks (a kind of aftercare procedure).

Alongside the Nuclear Energy Act, there are other relevant Acts, a number of the most important of which are listed below.

The General Administrative Law Act (Awb) applies to the procedures of practically all laws. This Act also regulates the procedures for public interaction in the procedures.

The Environmental Management Act (Wm) together with the Environmental Effect Assessment Decree specifies when an environmental impact report has to be made, in relation to a licence application for a nuclear installation.

The Environmental Law (General Provisions) Act (Wabo) regulates so-called environmental licensing. An environmental licence is a single integrated licence for buildings, accommodation, spatial elements, nature and the environment. In the case of a licence for a nuclear installation, the Wabo is relevant for all non-nuclear issues.

The Nuclear Incidents (Third Party Liability) Act (Wako) regulates the liability of operators of nuclear operations for nuclear accidents.

5.1.c Licensing system for activities and/or facilities for the management of spent fuel and radioactive waste

5.1.c.1 Requirements for a licence

The Nuclear Energy Act[12] states (Article 15 (b)) that a licence is required for the construction, commissioning, operation, alteration or dismantling of a nuclear facility. It is also required (Article 15, (a)) to have a licence for importing, exporting, owning and disposing of spent fuels. Article 29 of the Nuclear Energy Act specifies that a licence is required for the preparation, transport, ownership, import and disposal of radioactive material, for situations identified in the Radiation Protection Decree.

5.1.c.2 Process of licensing

As for all licensing procedures in the Netherlands, for the licensing procedures according to the Nuclear Energy Act, the requirements of the Awb apply.

Before a licence application is submitted, there is generally first informal consultation between the applicant and the competent regulatory authority. At this stage, a review is carried out of the application documents. The authority evaluates the application and prepares a draft decision. The public can make its views on the draft decision known. The authority then draws up a definitive decision, whereby the opinions of the public are taken into account. The opinions and the response to those opinions by the authority are added to the decision. Finally, interested parties can submit an objection and initiate proceedings with the Administrative Jurisdiction Division of the Council of State.

In certain cases, it is also compulsory to follow the procedure of the Environmental Impact Report (EIR). There is a permanent committee, the NCEA[20] (Commissie m.e.r) that is able to advise the competent regulatory authority on the desirability of an environmental import report procedure, and the requirements to be imposed on an Environmental Impact Report (EIR) to be prepared by the licence applicant.

5.1.c.3 Further requirements where necessary – the licence

In addition to the general rules according to the Nuclear Energy Act, there are also requirements that are imposed at the level of the licence. There are for example separate licences for operating a nuclear facility, carrying out a process with a radioactive material, using a device or the transport of spent fuels or a radioactive substance. Characteristic for the requirements in a licence is that they are aimed specifically at the licence holder and the application in question. If necessary, for a particular application, a 'tailor-made' approach can be employed.

5.1.c.4 Process and system of reviewing or updating a licence

Article 17 of the Nuclear Energy Act offers the possibility of implementing minimal modifications to nuclear installations, if required, without renewing or amending the licence. This is only permitted if the modifications do not result in any other or

[20] http://www.commissiemer.nl/english

greater impact on the environment than the original situation. Such minor modifications are still published.

In the event of non-minimal modifications, a revision of the licence is required. The licence holder must then update the documents for his safety evaluation (for example a safety report) and submit it to the authority for assessment. In certain cases, an environmental impact report procedure must also be followed. As with every licensing procedure, the public can make its opinions known, as with 'ordinary' licensing procedures.

5.1.d Appropriate control, management system, inspections and reporting

The competent regulatory authority ensures compliance by licence holders with their obligations. To be able to correctly implement this task, a system of inspections, audits, assessments of company reports and evaluation by the authority of special occurrences and incidents has been established. Inspections undertaken by the competent regulatory authority are supplemented by international missions, often under the auspices of the IAEA. The periodic safety evaluations undertaken by licence holders and submitted to the authority are an important starting point for the evaluations.

Inspections are planned and the results of those inspections are reported on.

As stated in the previous sections, only COVRA has a licence for the collection and storage of spent fuel and radioactive waste. COVRA operates a quality assurance system appropriate to its tasks. The ANVS ensures compliance by COVRA with all the licence conditions.

At this moment in time there are no preparations for construction of a disposal facility. In that connection, refer to the Introduction to the present report in which the policy in respect of the management of spent fuel and radioactive waste is outlined briefly. Within this policy, disposal far below ground is not envisaged until around 2130. Supervision of the construction or the functioning of a disposal facility is therefore not yet relevant.

5.1.e Enforcement actions

In accordance with the Nuclear Energy Act[12] (Article 37b), if serious shortcomings are observed at a licence holder, any action can be taken considered necessary by the authority. There are enforcement procedures that will be followed wherever Article 37b is applicable.

Article 19.1 of the Nuclear Energy Act grants the competent regulatory authority the authority to adapt licence conditions in order to protect the interests as laid down in Article 15b of the Act. Under certain circumstances, Article 20a offers the possibility of withdrawing the licence. Articles 22.3, 33.3, 66 and 83a (the latter with a reference to the Wabo) offer the possibility of using administrative enforcement.

Articles 5:21 through to 5:31c of the General Administrative Law Act (Awb) provide a further description of 'Order subject to administrative enforcement'. Article 5:32 grants the authority the power to impose an administrative enforcement order subject to a penalty.

5.1.f Allocation of responsibilities

The competent regulatory body is described briefly in section 5.0.a.3. This competent regulatory body develops policy and regulations in respect of the safe management of spent fuel and radioactive waste, issues licences and ensures compliance with applicable conditions from regulations and licences. For more information about the competent regulatory authority, see the section about ARTICLE 6 of the Directive.

The licence holders hold prime responsibility for the safe management of the spent fuel and radioactive waste generated by them. See also the section relating to ARTICLE 7 of the Directive. However, as soon as these materials are transferred by them to COVRA, responsibility for safe management lies with this organisation.

COVRA is the national waste management organisation. By having a single organisation that following acceptance of the radioactive waste materials is responsible for all further stages of radioactive waste management, there is clarity on the responsibility for those stages. The central collection, processing and storage of radioactive waste also ensures implementation of key aspects such as environmental hygiene, cost effectiveness and industrial hygiene.

5.1.g National requirements for public information and participation

The General Administrative Law Act (Awb) is the item of legislation that among other points regulates public interaction in the procedures. The Awb applies to the procedures of practically every law. The Awb also provides for the procedures for the publication of information about draft decisions, for example a decision to grant a licence. Such issues must be published in the Netherlands Government Gazette and in the national and local media. According to the Awb, the documentation for a licence application must be made available to the public. Every member of the public is permitted to present his or her views on the application and to demand a hearing.

In what is known as the Publication Act, specific requirements are laid down for the publication of new regulations. All new regulations are published on the Internet, in the Bulletin of Acts and Decrees and in the Government Gazette.

Further details are available in this report in the section accompanying ARTICLE 10 (transparency) of the Directive.

5.1.h Financing schemes for the management of spent fuel and radioactive waste – legal framework

Part of Dutch policy in respect of the financing of waste management is the principle of 'the polluter pays'. This principle also applies to the management of spent fuel and radioactive waste.

Legislation therefore includes requirements for governing the securing by licence holders of the financing for dismantling of their nuclear reactors.

For operators working with large volumes of scrap or with high level radioactive sources, regulations do apply for the financial security of management.

5.2 Improving the national framework

The central theme of this section is the improvement of the national framework of legislation and regulations and the related organisational aspects. This theme is elaborated in the following sub sections 5.2.a through to 5.2.d. For requirements relating to continuous improvement at licence holders, see section 7.2.

5.2.a Operational experience, national and international

The ANVS continuously monitors its own activities, see also section 5.2.b.

The ANVS monitors and evaluates the operations of the Dutch licence holders. Wherever conclusions can be drawn, lessons learned must be used for developing new policy, new regulations or amending licensing conditions.

There are regular bilateral contacts with authorities in European countries and the United States, whereby operational experience is exchanged. Within the EU, via the authority, the Netherlands is represented in the working groups of WENRA, ENSREG and HERCA. Representatives of the authority also participate in the activities of other international working groups under the auspices of the NEA and/or IAEA.

The ANVS also participates in international Peer Review activities, see section 5.2.d.

5.2.b Documented decision-making processes

The ANVS has documented decision-making processes. However, the ANVS is a learning organisation and attempts to improve constantly its decision-making processes.

5.2.c Technological developments and results of relevant research

The Nuclear Energy Act offers the competent regulatory body the possibility to take the initiative to adapt the scope of a licence and the accompanying licensing conditions, if new technological insights make this necessary in the judgement of the authority.

For its policy preparation work, the ANVS uses evaluation of technological developments and other studies, often undertaken by contracted parties.

5.2.d Results of self-assessments and Peer Reviews

Competent regulatory authority

Although there are no explicitly formulated legal requirements, current practice is that the expertise and effectiveness of the competent regulatory authority must be regularly evaluated. The resultant follow-up actions ensure that the authority remains effective.

Recently (2013 – 2014), the authority undertook a major self-assessment in the framework of an IRRS mission of the IAEA, which was concluded at the end of 2014. The findings of this assessment supported the Dutch effort to establish a single entity for the competent regulatory body in which all necessary knowledge and expertises about nuclear safety and radiation protection have been brought together. Prior to 2015, the tasks of the authority were undertaken by various mandated entities in different Ministries. The recommendations of the IRRS will be taken up in the framework of the ANVS. A follow-up mission of the IAEA is scheduled for 2018 to assess how the IRRS-recommendations and suggestions have been implemented.

Representatives of the authority regularly participate in international missions (under the auspices of the IAEA) in other countries. This too contributes to broadening knowledge and understanding among the staff of the authority.

Licence holders

The Netherlands has a decades-long tradition of Periodic Safety Evaluations, better known in international jargon as ‘Periodic Safety Reviews’ (PSRs). These are large-scale self-evaluations carried out by licence holders. The PSRs are assessed by the ANVS. The obligation to carry out PSRs has been included for more than 20 years in the licensing conditions, and for a slightly shorter period in guidelines drawn up by the authority. Directive 2009/71/EURATOM of 25 June 2009 on nuclear safety has also been implemented by a Ministerial Regulation, and that arrangement also includes this obligation about PSRs.

Licence holders welcome Peer Review teams with some regularity, such as those organised within the framework of WANO, or under the auspices of the International Atomic Energy Agency of the UN, the IAEA. The results of review activities under the auspices of the IAEA are always evaluated by the authority.

ARTICLE 6. **Competent regulatory authority**

This chapter refers to the competent regulatory authority or Regulatory Body (RB).

Important changes were recently made to this authority. More information is contained on those changes in the Introduction to this report.

6.0 Text of the Article and introductory comments

Article 6 – Competent regulatory authority
6.1. Each Member State shall establish and maintain a competent regulatory authority in the field of safety of spent fuel and radioactive waste management.

6.2. Member States shall ensure that the competent regulatory authority is functionally separate from any other body or organisation concerned with the promotion or utilisation of nuclear energy or radioactive material, including electricity production and radioisotope applications, or with the management of spent fuel and radioactive waste, in order to ensure effective independence from undue influence on its regulatory function.

6.3. Member States shall ensure that the competent regulatory authority is given the legal powers and human and financial resources necessary to fulfil its obligations in connection with the national framework as described in Article 5(1)(b), (c), (d) and (e).

6.0.a Introductory comments on recent developments in respect of the competent regulatory authority

The Introduction to this report outlines the developments which led to the establishment of the ANVS, the competent regulatory body mandated by the responsible Minister of I&M. On 1 January 2015, the ANVS started work as a Directorate of I&M; following approval and entry into effect of the necessary legislation (April 2016; see section 5.0.a.3), the ANVS will become what is known as an Independent Non-Departmental Public Body (ZBO), with its own legal authorities. The Minister of I&M in that situation will bear Ministerial responsibility for a proper functioning of the ANVS.

For the sake of completeness, it should be noted that according to the Nuclear Energy Act, there are other ministers and bodies which do have authorities according to that Act. Those bodies operate within other Ministries, but they have a far more limited role according to the Nuclear Energy Act than the ANVS, and they only have a limited number of staff involved in activities governed by the Act.

6.1 Establishment of a regulatory authority

6.1.a Legal framework within which the authority functions

The legal basis for the supervisory functions of the competent regulatory authority appears in the Nuclear Energy Act. The mandate of the ANVS is also contained in Article 20a of the Decree by the Minister of I&M on the awarding of the mandate , power of attorney and authority to the Secretary General of the Ministry and the department heads[21].

[21] Decision by the Minister of Infrastructure and the Environment dated 5 December 2011, no. IENM/BSK-2011/159456 relating to adoption of the organisation by the Ministry of Infrastructure and the Environment and the awarding of the mandate, power of attorney and authority to the Secretary General and department heads (Organisation and Mandate Decision Infrastructure and Environment 2012)

The legal and regulatory framework within which the ANVS operates is contained in outline in section 5.0 of this report, and in more detail in section 5.1.

See also section 6.3 on the legal authorities of the ANVS.

6.1.b Organisation of the authority

The competent regulatory authority has mandated the ANVS to implement the tasks of the authority described elsewhere in this report. The figure below shows the preliminary organisation of the ANVS as at 1 June 2016.

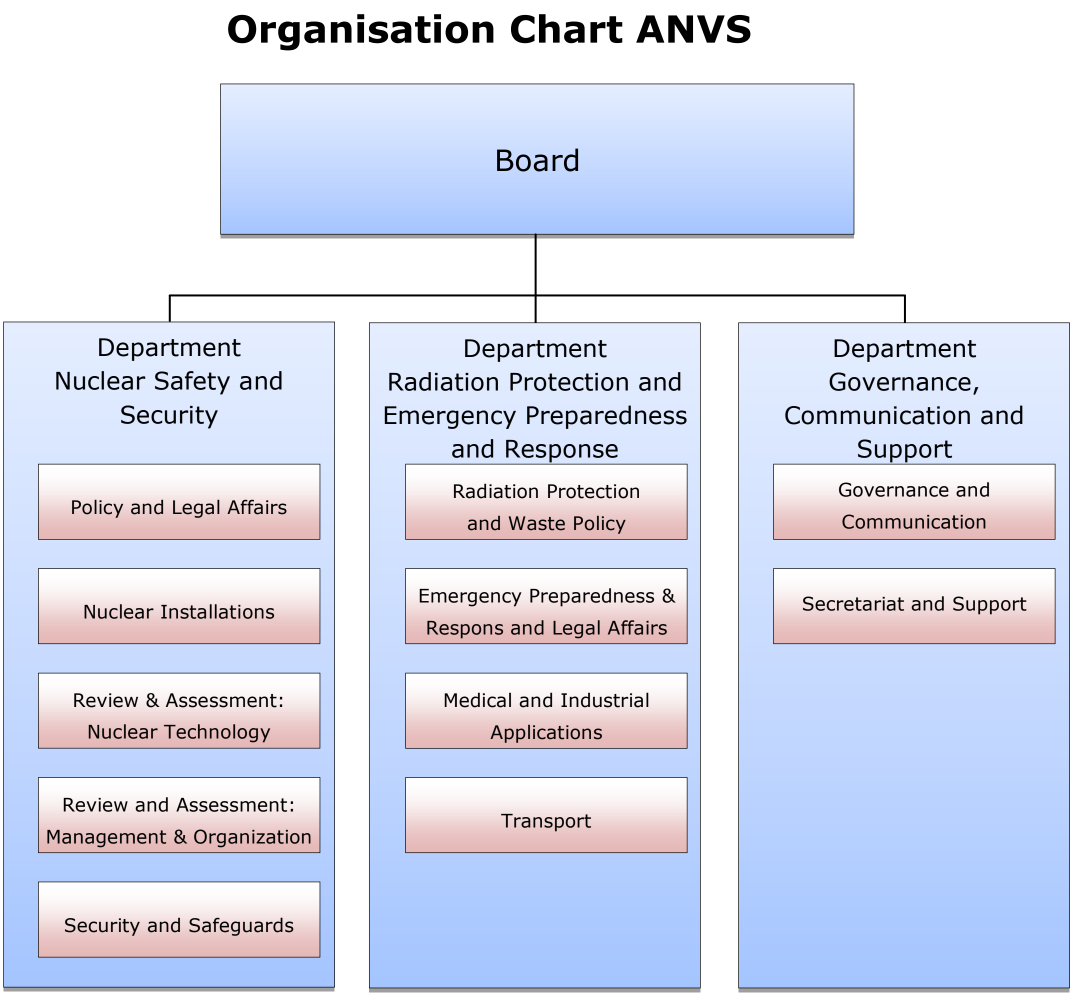


Figure 1 Preliminary organisation chart of the ANVS.

At present, the ANVS has three fields of operation: Nuclear Safety and Security, Radiation Protection and Waste Policy and Governance, Communication and Support. The ANVS has a staff of currently 122 FTE. In implementing its tasks, the ANVS can rely on support from various organisations, listed below.

The tasks of the ANVS can be summarised as follows:

- preparing legislation and regulations and policy (including the national programme);
- awarding licences and the accompanying review & assessment and evaluation tasks;
- supervision and enforcement; informing interested parties and the public;

- participating in activities of international organisations;
- maintaining relationships with comparable foreign authorities and national and international organisations;
- supporting national organisations with the provision of knowledge;
- having research in support of the implementation of its tasks.

6.1.c Supporting government organisations: RIVM

A number of tasks of the ANVS are entrusted to the National Institute for Public Health and the Environment (RIVM). These are above all specific tasks relating to radiation protection, such as nuclear accident prevention, implementing specific measurements (in the radiation laboratory) and policy support.

The division of the RIVM involved in these radiation tasks is not part of the ANVS, given the position of the RIVM as an independent and scientific knowledge institute. The authority maintains solid and long-term ties with the RIVM, and as such is a 'regular client' of the RIVM. Framework agreements and protocols have been drawn up for this purpose. The tasks of the RIVM/Radiation undertaken for the ANVS are covered by a single RIVM programme. The management of the RIVM programme is the responsibility of the board of the ANVS.

6.1.d Organisations for education and training

In the Netherlands, the RID/R3 group at the University of Technology in Delft and the Nuclear Research & Consultancy Group (NRG) in Petten and Arnhem are the best known providers of training in nuclear technology, nuclear safety and radiation protection. They provide educational services to both government and the private sector.

The ANVS also profits from internationally operating organisations with facilities for education and training. Examples include the German GRS[22], ENSTI (training institute at ETSON[23]), IAEA, OECD/NEA and others.

6.1.e Technical (safety) Support Organisations (TSOs)

The policy at ANVS is to maintain basic competences in house, while other work is contracted to third parties (such as the RIVM) or to TSOs (such as GRS and Lloyd's Register). In those areas where the internal competence is insufficient, or where specific far-reaching analyses are required, the authority has a budget for insourcing external specialists, TSOs or other consultancy organisations (such as NRG). Both GRS and NRG have a framework contract with the ANVS for the provision of services.

6.2 Independence of the competent regulatory authority

The competent regulatory body is in no way involved in the development of energy policy. Development of such policy is carried out by the Ministry of Economic Affairs.

The involvement of the authority in nuclear energy is restricted to nuclear safety and radiation protection and related issues. The authority is transparent in its decision-making processes, which also positively promote the perception of its independence. The reporting obligations of the authority contribute to that transparency.

The Minister of I&M as competent regulatory authority reports to Parliament on nuclear safety, radiation protection, management of radioactive waste and other issues subject to the Nuclear Energy Act. Results of important studies undertaken under the auspices of the authority are also published in this way. In addition,

[22] Gesellschaft Für Reaktorsicherheit, GRS
[23] European Technical Safety Organisation Network, ETSON

Parliament can call upon the Minister to inform Parliament on issues considered relevant by its members.

The competent regulatory body manages no radioactive waste and no spent fuel. The management of these substances lies with licence holders, whereas COVRA is responsible for the long-term management of these materials. The ANVS supervises the activities of all these licence holders.

As described in the Introduction to this report, the ANVS is currently a directorate of the Ministry of I&M and has been mandated to implement the tasks of the competent regulatory authority. It was also described elsewhere that the plan is for the ANVS to become and Independent Non-Departmental Public Body (ZBO) with its own statutory authorities. In April 2016 the House of Representatives as well as the Senate approved the Bill[24], it is envisaged that in 2017 the ANVS will operate as a legally Independent Non-Departmental Public Body (in Dutch ZBO) with its own authorities, following implementation of the Bill to amend current legislation[25].

6.3 Legal authorities and human and financial resources of the competent regulatory authority

6.3.a Legal authorities

The statutory basis for the activities of the competent regulatory body appears in the Nuclear Energy Act. The tasks and authorities of the authority are laid down in underlying regulations.

The correct management of the process of licensing according to the Nuclear Energy Act has been mandated to the ANVS. For more information see section 5.1.c.2. The authority also formulates additional licensing conditions, at licence level, that apply alongside the rules generally applicable according to the Nuclear Energy Act. See section 5.1.c.3 and elsewhere.

Licences may have to be amended thanks to initiatives by licence holders, or as a result of new insights that force the authority to make changes. See section 5.1.c.4 and elsewhere.

Via enforcement procedures, if serious shortcomings are observed at a licence holder, the authority can take any measure considered necessary by the authority in that situation. See section 5.1.e and elsewhere.

6.3.b Human resources

The ANVS operates a regular planning and control cycle. In this cycle, the tasks to be undertaken are planned, taking account of the staffing levels available, while priorities are set when and wherever necessary. Over the past few years, the staff of the ANVS has been extended by 20 FTE. At present, the ANVS has a staff of currently 122 FTE.

The sufficiency of staffing levels for the establishment of the ANVS was evaluated in the framework of the IRRS mission and will be re-evaluated in 2016.

As shown in sections 6.1.c, 6.1.d and 6.1.e, the authority can where necessary rely on supporting organisations such as the RIVM, GRS, NRG and Lloyd's Register.

[24] House of Representatives, session year 2014 – 2015, 34 219, no. 2 'Amendment to the Nuclear Energy Act in connection with the appointment of the Authority for Nuclear Safety and Radiation Protection – No. 2 White Paper'

[25] See ARTICLE 1a of the Framework Act on Non-Departmental Public Bodies: "independent non-departmental public body: a body of central government which in law, according to the law, in a Ministerial Decree or according to the law by Ministerial Decision is entrusted with public authority and is not hierarchically subordinate to a Minister"

6.3.c Financial resources

The competent regulatory authority has sufficient financial resources to fund its staff and to contract TSO services and education and training. Office space and ICT infrastructure and services are provided by the Ministry of I&M.

ARTICLE 7. **Licence holders**

This chapter describes how the Netherlands ensures that the prime responsibility for the safety of the management of spent fuel and radioactive waste lies with the licence holders.

7.0 Text of the Article

Article 7 – Licence holders

7.1. Member States shall ensure that the prime responsibility for the safety of spent fuel and radioactive waste management facilities and/or activities rest with the licence holder. That responsibility cannot be delegated

7.2. Member States shall ensure that the national framework in place require licence holders, under the regulatory control of the competent regulatory authority, to regularly assess, verify and continuously improve, as far as is reasonably achievable, the safety of the radioactive waste and spent fuel management facility or activity in a systematic and verifiable manner. This shall be achieved through an appropriate safety assessment, other arguments and evidence.

7.3. As part of the licensing of a facility or activity the safety demonstration shall cover the development and operation of an activity and the development, operation and decommissioning of a facility or closure of a disposal facility as well as the post-closure phase of a disposal facility. The extent of the safety demonstration shall be commensurate with the complexity of the operation and the magnitude of the hazards associated with the radioactive waste and spent fuel, and the facility or activity. The licensing process shall contribute to safety in the facility or activity during normal operating conditions, anticipated operational occurrences and design basis accidents. It shall provide the required assurance of safety in the facility or activity. Measures shall be in place to prevent accidents and mitigate the consequences of accidents, including verification of physical barriers and the licence holder's administrative protection procedures that would have to fail before workers and the general public would be significantly affected by ionising radiation. That approach shall identify and reduce uncertainties.

7.4. Member States shall ensure that the national framework require licence holders to establish and implement integrated management systems, including quality assurance, which give due priority for overall management of spent fuel and radioactive waste to safety and are regularly verified by the competent regulatory authority.

7.5. Member States shall ensure that the national framework require licence holders to provide for and maintain adequate financial and human resources to fulfil their obligations with respect to the safety of spent fuel and radioactive waste management as laid down in paragraphs 1 to 4.

7.1 Guarantees that prime responsibility for the safe management of spent fuel and radioactive waste lies with the licence holder

The Netherlands has implemented Directive 2009/71/EURATOM. The responsibility of the licence holder emerges from the principles of the Dutch legal system, including the Nuclear Energy Act and underlying regulations, and the obligations referred to therein for the licence holder. This is explained further below.

Nuclear Energy Act

The Nuclear Energy Act contains a number of articles relating to criteria, interests and circumstances that must be complied with in order to be able to grant a licence. Article 70 of the Nuclear Energy Act specifies that a licence issued according to this

Act is personal. This engenders guarantees for the necessary expertise and reliability in relation to safety. Reliability in relation to safety can also be related to financial solvency.

The responsibilities accompanying a licence can only be transferred to another person with permission from the responsible Minister. Conditions may be imposed on the transfer of the licence to a third party. This enables the Minister to assess whether the potential new licence holder meets the same standards as the previous licence holder.

Radiation Protection Decree

A further elaboration can also be found in the Radiation Protection Decree (Bs), as in Article 5, in which the licence holder is required to keep exposure of the population as a result of its activities as low as reasonably achievable. There are many regulations in the Bs that specify "*The operator ensures that .....* ". The Bs also includes requirements in respect of the competence of the operator or licence holder.

Radioactive waste policy

As already outlined in the Introduction to this report, the radioactive waste policy ties in with the policy in respect of conventional waste. In that policy, responsibility for the sound management of the waste flows is placed primarily with the waste generator. The same applies for the management of spent fuel and radioactive waste.

Ministerial regulation concerning nuclear safety, in implementation of European Directive no. 2009/71

This regulation[26] relates to the implementation of the Directive no. 2009/71 of the European Council, in adopting a community framework for nuclear safety of nuclear installations. In particular Article 2.1 of the regulation emphasises the central role of the licence holder in guaranteeing safety.

7.2 Guarantees of regular evaluation of the safety and continuous improvement of the safety

In section 5.1.b of this report the national regulations for the safe management of spent fuel and radioactive waste are already explained. Section 5.1.c also explains the related licensing system. Appropriate control and enforcement by government are discussed in sections and 5.1.e.

The licences contain conditions that require the licence holder to regularly evaluate the nuclear safety and radiation protection, and to report on those issues to the ANVS. Nuclear installations must have an adequate management system among others describing verification procedures. There is also a Nuclear Safety Rule NVR GS-R-3 which formulates these requirements in general terms.

For installations for the generation of nuclear energy, the production, processing or reprocessing of spent fuels or the storage of spent fuels, there is a generally applicable Ministerial Regulation[27] that among others requires a periodic safety evaluation.

In the Netherlands, for decades the implementation of extensive periodic safety evaluations by licence holders has been standard practice, and this practice pre-exists the abovementioned regulations. In these evaluations, determining and probability techniques are employed. The subjects of study include the technical,

[26] Regulation from the Minister Economic Affairs, Agriculture and Innovation and he Secretary of State for Social Affairs and Employment dated 18 July 2011, no. WJZ/11014550, concerning the implementation of Directive no. 2009/71/Euratom of the Council of the European Union dated 25 June 2009 in adoption of Community Framework for Nuclear Safety of Nuclear installations (OJEU L 172/18) (Temporary regulation for the implementation of Directive no. 2009/71/Euratom on nuclear safety)

[27] Regulation in implementation of Directive no. 2009/71/Euratom on nuclear safety

operational, human and organisational arrangements in relation to safety and radiation protection. In the evaluations, findings are also included from international peer review missions that visit the installations with some regularity. In the past, evaluations have contributed to decision making on the implementation of modifications in installations and adaptations to the operational procedures.

COVRA undergoes very extensive safety evaluations on a five-yearly and ten-yearly cycle. The nuclear power plant in Borssele undergoes very extensive safety evaluations every ten years, and more limited evaluations every two years, in which the applicable basis for the licence is assessed. For detailed information about safety evaluations at the nuclear power plant, among other documents, consult the report[28] from the Netherlands for Directive 2009/71/EURATOM.

7.3 Demonstration of the safety of a facility or activity during the entire lifecycle

Section 5.1.c of this report explains the applicable system of licensing. Appropriate control and enforcement by the government are discussed in 5.1.d and 5.1.e.

The Nuclear Energy Act (Article 15b) specifies that a licence is needed for the construction, operation and dismantling of nuclear installations – in other words, at the start of each phase in the entire lifecycle. Licence applications include extensive safety evaluations and the accompanying documentation. In these safety analyses, attention is focused on organisational and technical arrangements that are aimed at preventing accidents and mitigating the consequences of accidents.

The obligation to carry out periodic safety evaluations as described in section 7.2 helps ensure that during the entire lifecycle, the safety of a facility is regularly demonstrated.

For nuclear power plants and research reactors, additional regulations apply that compulsorily require the establishment of a dismantling plan and financial security (for dismantling).

7.4 Guarantees that licence holders adopt and employ management systems

The Ministerial Regulation on nuclear safety in implementation of European Directive no. 2009/71, specifies in Article 5 that the licence holder must ensure that the management systems of the nuclear installation are drawn up and implemented in such a way that sufficient priority is given to nuclear safety.

Nuclear Safety Rule NVR GS-R-3 ‘The Management System for Facilities and Activities’ requires that every licence holder adopts and employs a management system in which priority is given to safety. The requirements in the NVR apply to all nuclear facilities.

In the licences for installations, reference is also made to additional NVRs with more detailed requirements on the management system, adapted to what is necessary for those facilities.

In addition to the above, COVRA has already implemented industrial standard NEN-ISO 9000 – 9004.

The Integrated Management System at COVRA is part of the COVRA licence and therefore can be assessed by the competent regulatory authority. By way of illustration, the content of the management system at COVRA is discussed below.

[28] See section 6.2 and Annex 3 of the national rapport: “Report to the European Commission on the implementation of Council Directive 2009/71/EURATOM – First National Report of the Kingdom of the Netherlands as required under Article 9.1”

Integrated Management System (IMS) at COVRA

The heart of the management system IMS is the 'Integrated Management System Manual'. This IMS Manual includes:

- Policy rules;
- The values and expectations of senior management;
- Description of the organisation;
- Description of how the management system complies with the requirements imposed;
- Description of the operating processes and background information on how work is prepared, implemented, evaluated, recorded, assessed and improved.

7.5 Requiring licence holders to provide for and maintain adequate financial and human resources

7.5.a Adequate financial resources

Nuclear Safety Rule NVR-GS-R-3 'The Management System for Facilities and Activities' requires of the management of the organisation that it makes available those resources needed for correctly implementing the activities of the organisation. Resources also include the financial resources.

The Ministerial Regulation on nuclear safety in implementation of European Directive no. 2009/71, specifies in Article 7 that the licence holder must have sufficient financial and human resources to comply with the obligations in respect of nuclear safety of the nuclear installation under its authority.

One of the principles of the national policy for the management of spent fuel and radioactive waste is 'the polluter pays'. All costs arising from radioactive waste management must therefore be borne by the waste generator.

There are different financial schemes between COVRA and the waste generators that make possible the financing of the tasks of COVRA in respect of the management of spent fuel and radioactive waste.

For the transfer of low level and intermediate level radioactive waste to COVRA, lists of charges are used. Standard waste packaging is used, and with this type of waste, COVRA is paid for each waste package received. The charges already include the fact that in principle the waste will be placed in a disposal facility after at least 100 years aboveground storage.

In respect of the management of spent fuel and high level radioactive waste, the operators of nuclear power plants and research reactors have jointly decided to build a special storage facility, the HABOG. This building was commissioned on the COVRA site in 2003. Both the construction costs and the operating costs are borne by the waste generators.

The charges employed by COVRA are corrected annually by the price index. Every five years, however, the charge structure is evaluated to determine whether structural adjustments are needed.

Because for the time being definitive disposal has been envisaged following a long period of aboveground storage, the cost estimate for the construction and operation of a national disposal facility is being updated within the OPERA research programme. The funds available to and supplemented by COVRA for final disposal are managed by COVRA in a separate fund, on an account held by the Ministry of Finance.

7.5.b Human resources

The Nuclear Energy Act specifies that a licence application must contain an estimate of the number of staff required, and information about their tasks, responsibilities

and where applicable qualifications. The Radiation Protection Decree also imposes requirements on the competence of the staff.

The previously mentioned NVR-GS-R-3 safety rule 'The Management System for Facilities and Activities' requires from the management of the organisation that it makes the resources available needed for correctly implementing the activities of the organisation. In NVR-GS-R-3, members of staff are included among the Resources, together with such elements as infrastructure, working environment, information, knowledge and material and financial resources.

With any licence application, the applicant must submit a training and education plan to the competent regulatory authority.

Operational practice at COVRA

The above referred to requirements also apply to COVRA and its facilities for the management of spent fuel and radioactive waste. COVRA has drawn up a Staff Qualification Plan that is part of the generic 'Integrated Management System'. This plan describes the numerous aspects of human resources such as responsibilities, lines of communication, interfaces between various levels in the organisation, the required level of expertise and the requirements in terms of education and training. An elaborated training plan ensures that sufficient numbers of trained personnel with sufficient expertise are always available.

Any change to the organisation, for example to the management, must be reported to the authorities.

ARTICLE 8. **Expertise and skills**

This chapter describes how the Netherlands ensures that all parties make arrangements for complying with the requirements contained in Article 8 of the Directive.

8.0 Text of the Article

Article 8 – Expertise and skills
Member States shall ensure that the national framework require all parties to make arrangements for education and training for their staff, as well as research and development activities to cover the needs of the national programme for spent fuel and radioactive waste management in order to obtain, maintain and to further develop necessary expertise and skills.

8.1 Expertise and skills of the licence holders

The Nuclear Energy Act specifies that a licence application must contain an estimate of the number of members of staff required, together with information about their tasks, responsibilities and where applicable their qualifications. The Radiation Protection Decree also imposes requirements on the competence of personnel of licence holders, in particular in Articles 9 through to 12 of this Decree. See also section 7.5.b of this report.

The Ministerial Regulation on nuclear safety, in implementation of European Directive no. 2009/71, specifies in Article 6 that the licence holder must have a training plan for education and training of the staff, with a view to the nuclear safety of the nuclear installations under its management.

COVRA has drawn up a Staff Qualification Plan that is part of the generic 'Integrated Management System'. For more details see section 7.5 of this report.

The Borssele nuclear power plant has a very extensive system of qualification and training for its staff. See among other documents the report[29] from the Netherlands for Directive 2009/71/EURATOM dated July 2014.

8.2 Expertise and skills at the ANVS

The expertise of the ANVS covers a range of disciplines including radiation protection, nuclear safety, safety evaluations, security, non-proliferation, contingency planning, legislation and licensing.

Wherever necessary, the ANVS provides tailor-made training to its staff. Possibilities have been identified in the Netherlands and abroad, as outlined for example in section 6.1.d of this report. Wherever necessary, the authority can seek support in its tasks from external organisations, see among others sections 6.1.c and 6.1.e of this report.

In addition to training in regular or tailor-made courses, staff participate in international workshops, conferences and visits to foreign competent regulatory authorities. There is also information exchange via the international networks of among others OECD/NEA, IAEA and the EU.

[29] See section 7.1 of the national report: "Report to the European Commission on the implementation of Council Directive 2009/71/EURATOM – First National Report of the Kingdom of the Netherlands as required under Article 9.1"

8.3 Activities for complying with the National Programme

The Research Programme Disposal of Radioactive Waste (OPERA) is currently underway. The majority of the study results from this programme are expected in 2016. However, the national programme must be submitted to the European Commission at an earlier date and will only be able to make use of the results available at that time.

The OPERA programme is coordinated by COVRA. The programme has been financed 50-50 by government and the nuclear sector. With the implementation of the directive, COVRA is obliged to finance the costs incurred for research and development for the management of radioactive waste and spent fuel by charging on these costs via its standard charges.

Before the OPERA research programme was initiated, there have been other multiyear research programmes. The Netherlands has a history of research into definitive disposal, over a number of decades.

ARTICLE 9. **Financial resources**

The national framework in the Netherlands provides for sufficient financial resources for implementation of the National Programme.

9.0 Text of the Article

Article 9 – Financial resources

Member States shall ensure that the national framework require that adequate financial resources be available when needed for the implementation of national programmes referred to in Article 11, especially for the management of spent fuel and radioactive waste, taking due account of the responsibility of spent fuel and radioactive waste generators.

9.1 Implementation of Article 9

9.1.a Financial resources for the management of spent fuel and radioactive waste

In Dutch policy, the waste generators are required to bear the costs for the management of spent fuel and radioactive waste.

The Dutch policy on radioactive waste assumes the aboveground storage of the radioactive waste for a period of at least 100 years, at which point, around 2130, deep underground disposal is envisaged. The definitive decision on this issue will not be taken until around 2100.

The period of time in advance of geological disposal is used to grow the savings for the aboveground storage and final disposal.

Given the relatively small volumes of radioactive waste and the high costs for geological disposal, at present the policy assumes a single disposal facility for low and intermediate level radioactive waste and high level radioactive waste.

COVRA is the body that reserves and manages the financial resources for both long-term aboveground storage and for implementation of (geological) disposal of the waste. At present, COVRA also has a coordinating task in terms of research (and its financing) into disposal. Via schemes between COVRA and the waste generators, the necessary financial resources for these activities are collected by COVRA.

The details of the financial schemes between the waste generators and COVRA have already been described in section 7.5.a of this report.

The disposal research programme OPERA is coordinated by COVRA. This programme has been financed 50-50 by government and the nuclear sector. With the implementation of the directive, COVRA is obliged to finance the costs incurred for research and development for the management of radioactive waste and spent fuel by charging on these costs via its standard charges.

9.1.b Financial resources for dismantling nuclear installations

The Netherlands has established arrangements that require nuclear power stations and research reactors to have a dismantling plan and financial security (Nuclear Energy Act, Article 15f). The financial security must be approved by the Ministers of Infrastructure and the Environment and Finance. The financial security guarantees that even in the event of unexpected closure of business, sufficient financial resources are available for the responsible dismantling of the installations.

9.1.c Financial resources for other activities

For operators working with large volumes of scrap or highly active sources, there are statutory obligations for securing the management of these potential waste flows.

At the research location in Petten, a volume of historical radioactive waste is still present, that predates the establishment of COVRA. The costs for the disposal of this waste are for the account of the owner, the Energieonderzoekscentrum Nederland (ECN). These costs include adapting installations to make them suitable for repackaging the waste for transport, transport to third parties and treatment of the waste at third parties, transport to COVRA and the costs charged by COVRA for the storage and disposal of the waste.

ARTICLE 10. **Transparency**

This chapter describes how the Netherlands complies with the requirements in Article 10 of the Directive concerning transparency to workers and the general public.

10.0 Text of Article

Article 10 - Transparency

10.1. Member States shall ensure that necessary information on the management of spent fuel and radioactive waste be made available to workers and the general public. This obligation includes ensuring that the competent regulatory authority inform the public in the fields of its competence. Information shall be made available to the public in accordance with national legislation and international obligations, provided that this does not jeopardise other interests such as, inter alia, security, recognised in national legislation or international obligations.

10.2. Member States shall ensure that the public be given the necessary opportunities to participate effectively in the decision- making process regarding spent fuel and radioactive waste management in accordance with national legislation and international obligations.

10.1 Implementation

10.1.a Provision of information to the public and employees

The General Administrative Law Act (Awb) is a piece of legislation that among other things regulates the involvement of the public in the (licensing) procedures and the publication of information on decisions and decrees. See section 5.1.g of this report where this is described.

There is also a Publication Act that lays down requirements for the publication of new regulations. All new regulations are published on the Internet and in the Bulletin of Acts and Decrees and in the Government Gazette, following ratification by Parliament. Ministries can also make their own additional arrangements to improve the accessibility of their regulations.

The Dutch Government Information (Public Access) Act (Wob) specifies that information managed by public bodies is in principle open to the public. Exceptions are listed in Article 10 of the Wob, and relate to such issues as ‘State Security’ and confidential commercial information. The Wob specifies that authorities must make information public, unsolicited, because this is in the interests of good democratic government. According to Article 3 of the Wob, any individual may request information about an administrative issue. This information may be contained in documents in the possession of public bodies or businesses carrying out work on behalf of those public bodies.

The Minister of Infrastructure and the Environment bears Ministerial responsibility for the ANVS and reports to Parliament. Everything reported in Parliament is immediately available on the government website www.overheid.nl and is therefore available to any interested party.

International reports, such as this report for the Directive, the national programme and the report for the Joint Convention[30], are made available to any interested party via reporting to Parliament.

[30] In full: ‘Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management’

10.1.b Communication strategy of the competent regulatory authority

General

Communication by the competent regulatory authority fulfils the statutory requirements as described in section 10.1.a.

The ANVS has been mandated to implement the tasks of the authority. The ANVS is transparent in its communication about its decisions; decisions and background information relating to its activities are published on its website. This website is available in both Dutch and English.

The website of the ANVS[31] also provides an insight into the organisation structure of the ANVS.

Use of language

The ANVS is aware of the different backgrounds of informed groups and the public. Ministries and the ANVS often publish both easy-to-ready press releases and detailed reports. For certain international reports, details and summarised versions are available (in Dutch). The majority of information addressed to the Dutch public (general public, employees of public bodies, Parliament, etc.) is published in Dutch. The national programme and this report are also published in Dutch. Information intended for more informed groups (experts) and colleagues in other countries is often published in English.

Frequency of updating the information

Information about laws, regulations, licences and related decisions is published on the government site as soon as it becomes available. In other words, this information is constantly kept up to date.

The start of licensing procedures and the related information meetings are announced in good time in major newspapers and on the Internet.

Every incident to be reported is also published on the Internet. An annual report is also submitted to the Parliament containing an overview of registered incidents at nuclear installations.

Information provision in emergencies

The Nuclear Energy Act (Article 43) provides for the issuing of information to members of the public who could be affected by a nuclear accident. In line with the responsibility for the response in emergency situations from the government, the government is also responsible for information provision. In such situations, information provision will be undertaken in close collaboration with local governments in the threatened or affected area.

If there is a threat of an emergency situation that requires national coordination and the intervention of different Ministries, the so-called National Crisis Centre (NCC) will swing into action and establish a national crisis communication centre.

The government websites contain information about the subject 'crisis'. Information can be found on many aspects of nuclear incidents. Another section of the government websites is only available during a crisis and then for example will contain a detailed list of questions and answers.

Handling non-publishable information

As is the case with all public bodies, the ANVS does comply with the requirements of the Wob. In Article 10, the Wob offers a number of exceptions to public access to government information, as described in section 10.1.a.

[31] http://english.autoriteitnvs.nl/

10.1.c Participation by the public in decision making

Participation by interested parties via public consultation during the licensing process is laid down in the already mentioned Awb Act. Participation is also compulsory in the procedures of an environmental impact report. The environmental impact report procedure includes meetings where the licence holder, the authority (ANVS) and the public participate. The public can present its views on proposed decisions, and the competent body will respond in its rulings. There are opportunities for individual citizens to appeal, if they disagree with a decision.

In drawing up regulations, public participation is effectively indirectly achieved via Parliament.

As concerns the management of spent fuel and radioactive waste, via the procedures, the public is able to participate in the decision-making processes involving licensing for installations in which spent fuel and/or radioactive waste are maintained.

Current policy does not envisage definitive disposal in the short term; furthermore, as yet no location has been chosen. A decision is not envisaged until around the year 2100. At present, there is therefore no specific licensing procedure for a disposal facility.

For more information about decision making on disposal and public involvement in that process, see chapter 6 of the national programme.

ARTICLE 11. **National programmes**

This chapter discusses implementation by the Netherlands of the national programme for the management of spent fuel and radioactive waste.

In accordance with Recommendations from ENSREG, the status of implementation in respect of Articles 12.1 a, b, d - k appear in this chapter, in the section relating to Article 11.1.

11.0 Text of Article

Article 11 – National programmes

11.1. Each Member State shall ensure the implementation of its national programme for the management of spent fuel and radioactive waste ('national programme'), covering all types of spent fuel and radioactive waste under its jurisdiction and all stages of spent fuel and radioactive waste management from generation to disposal

11.2. Each Member State shall regularly review and update its national programme, taking into account technical and scientific progress as appropriate as well as recommendations, lessons learned and good practices from peer reviews.

11.1 Ensuring implementation of the national programme

11.1.a National programme submitted to the Commission

The Netherlands must submit a national programme to the Commission, and will also make this document available to the public, via various means. The national programme describes the policy on spent fuel and radioactive waste and how all stages of spent fuel and radioactive waste management are organised, in practice.

The legal framework for the management of spent fuel and radioactive waste appears in section 5.0.a of this report.

11.1.b Progress in implementation of the National programme

The progress of implementation is described below in respect of Article 12 sub a, b and d through to k. The basis for dealing with the sub articles is above all contained in the national programme for the Netherlands.

12.1.a. the overall objectives of the Member States' national policy in respect of radioactive waste and spent fuel management

The overall objectives of the policy appear among others in the Introduction to this report and in part B (chapter 4) of the national programme. These objectives have been achieved. They are discussed in outline below.

The policy on radiation protection is aimed at *protecting man and the environment against the risks of exposure to ionising radiation.* This policy remains fully in force in the Netherlands, and is applicable to the management of spent fuel and radioactive waste.

The policy is also aimed at *minimising waste flows*. Prevention of waste generation and encouraging reuse are successful policy instruments. The prices set by COVRA for all types of radioactive waste tie in with in with this policy, and help to make it a success. Decay storage is an instrument currently being studied, relating to storage at COVRA for a period of 25 years. During decay storage, materials can decay to below the release threshold, and then be removed as non-radioactive waste.

Safe management now and in the future – storage and disposal is another element of the policy. The Netherlands has established central facilities at COVRA for the storage of spent fuel and radioactive waste. Safe management for the distant future with definitive disposal is also part of the policy. New supplementary policy permits a dual strategy with both the possibility of realising a national disposal facility and the possibility of international collaboration in the field of the management of radioactive waste (including disposal).

Safe management now and in the future – retrievability is another part of the policy.

12.1.b. the most significant milestones and clear timetables for the achievement of those milestones in light of the overarching objectives of the national programmes

The most important milestones and their timetable appear in the document of the national programme in paragraphs 7.1 and 7.2. A number of important issues from that document include:

Defining criteria for the start of the first environmental impact report: the potential environmental effects of disposal must be considered in the decision making, and this will take place in the future in the form of an environmental impact report. The definition of criteria is planned for 2030.

Reporting on the implementation of the national programme; a report must be submitted in a three-yearly cycle to the Commission, in the form of a national report; this report is the first to be submitted to the Commission.

The national programme is updated every ten years; the first version of the programme will be submitted to the Commission together with this report.

Drawing up a waste inventory: in the progress report on the national programme (in the national report), a waste inventory must be included. COVRA will draw up the waste inventory. This will be updated every three years.

Appointing a sounding board group with broad relevant expertise and establishing a system in which the implementation of a trend analysis is laid down: the group will advise on all aspects of policy on radioactive waste and in that way help to ensure the progress of the programme. Planned to be implemented at the end of 2016.

Closure of the Borssele nuclear power plant: closure of the only nuclear power plant still operational in the Netherlands is planned for 2033. The plant is the largest source of high level radioactive waste in the Netherlands.

Receipt of last waste from reprocessing of spent fuel in the Netherlands: is envisaged at the latest in 2052.

End of period of aboveground storage at COVRA: The buildings at COVRA are suitable for the safe storage of waste for the next 100 years; periodical maintenance of the buildings can expand this period. After that period, a decision will have to be taken on the follow-up process.

Decision on disposal: COVRA envisages aboveground storage for at least 100 years. If a disposal facility has to be realised by around 2130, the decision making on that issue will have be concluded by around the year 2100.

12.1.d. the concepts, plans and technical solutions for spent fuel and radioactive waste management, from generation to disposal

The concepts and solutions for management appear in the document of the national programme in section 4.3. The outlines are also reproduced in this national report. Below, the concepts, plans and technical solutions are once again described in brief.

The Netherlands has opted for a single central organisation for the management of all spent fuel and radioactive waste, at a single location. That is COVRA. The aboveground storage buildings at COVRA comply with all applicable regulations on

nuclear safety and radiation protection. The policy assumes disposal of all radioactive waste after at least 100 years aboveground storage (approximately in 2130), but decision making is not envisaged until the year 2100. For that reason, no definitive choice has been made for a design or location of the disposal facility.

12.1.e. the concepts or plans for the post-closure period of a disposal facility's lifetime, including the period during which appropriate controls are retained and the means to be employed to preserve knowledge of that facility in the longer term

The policy assumes taking a decision around the year 2100. The policy also assumes a period of retrievability in disposal. According to studies, retrievability should be possible for a period of up to several hundred years.

12.1.f. the research, development and demonstration activities that are needed in order to implement solutions for the management of spent fuel and radioactive waste

The Netherlands has a history of several national research programmes into disposal. Two programmes from the past were OPLA[32] (1985 – 1993) and CORA[33] (1996 – 2000). The current five-year national research programme is entitled OPERA, and is expected to publish the majority of its results in 2016. In the past, Dutch researchers participated in experiments in Germany (in salt formations). At present there is collaboration in underground facilities in Belgium (clay).

12.1.g. the responsibility for the implementation of the national programme and the key performance indicators to monitor progress towards implementation

The design of policy and regulations in the national programme is the responsibility of the ANVS, mandated by the minister of I&M. The research component (the OPERA programme) has been delegated to COVRA, that is responsible for the project-based implementation of research work within the OPERA programme.

The three performance indicators below show the current status of progress of the national programme.

Financing – the available sum for disposal must be sufficient for the preparation, construction, operation and closure of the disposal facilities.

Status of action points / milestones – these are summarised in point 12.1.b and must be implemented in good time.

Capacity of COVRA – the storage capacity at COVRA must be sufficient for the expected volume of radioactive waste in the Netherlands.

12.1.h. an assessment of the national programme costs and the underlying basis and hypotheses for the assessment, which must include a profile over time

The largest future cost item for the national programme is realisation of a national disposal facility after at least 100 years of aboveground storage of spent fuel and radioactive waste at COVRA. The applicable financing arrangements are discussed in 12.1.i below. In the past, cost estimates were made for this option. These estimates will be updated in OPERA.

The dual policy also opens up the option of a multinational disposal facility, see point 12.1.a above. In this option, the costs for the Netherlands are expected to be lower.

12.1.i. the financing scheme(s) in force

There are adequate financing schemes for the management now and in the future of spent fuel and radioactive waste. See also sections 9.1.a and 7.5.a of this report.

For the financing of the research into disposal, see section 9.1.a of this report.

[32] OPLA: OPberging te Land (Land-based storage)
[33] CORA: Commissie Opberging Radioactief Afval (Commission for the Storage of Radioactive Waste)

There are adequate financing schemes for the dismantling of nuclear installations, see section 9.1.b of this report.

12.1.j. a transparency policy or process as referred to in Article 10

This national report discusses transparency under ARTICLE 10 as well as how transparency is anchored in legislation and regulations in the communication policy of the ANVS. COVRA, an important partner to the national programme, operates a transparency policy in which communication with the public is very proactive.

12.1.k. if any, the agreement(s) concluded with a Member State or a third country on management of spent fuel or radioactive waste, including on the use of disposal facilities

In 2012, a treaty was signed by the Republic of France and the Kingdom of the Netherlands that regulates the receipt and reprocessing by Areva NC in France of Dutch spent fuel and the return to the Netherlands of the radioactive residues from reprocessing.

11.2 Regular updating of the national programme

The Netherlands will update its national programme at least once every ten years. This complies with the regulations of the Directive.

ARTICLE 12. **Contents of the national programmes**

This chapter reproduces the text of Article 12 of the Directive, but does not discuss in detail compliance:

- **In accordance with Recommendations from ENSREG, the status of implementation in respect of 12.1 a, b, d - k appears in Article 11 of this document.**
- **In accordance with the Recommendations from ENSREG, the waste inventory is discussed under Article 12 (12.1.c) together with an overview of the documentation that belongs with the separately published national programme.**

12.0 Text of Article

Article 12 – Contents of the national programmes

12.1. The national programmes shall set out how the Member States intend to implement their national policies referred to in Article 4 for the responsible and safe management of spent fuel and radioactive waste to secure the aims of this Directive, and shall include all of the following:

a. the overall objectives of the Member State's national policy in respect of spent fuel and radioactive waste management;

b. the significant milestones and clear timeframes for the achievement of those milestones in light of the over- arching objectives of the national programme;

c. an inventory of all spent fuel and radioactive waste and estimates for future quantities, including those from decommissioning, clearly indicating the location and amount of the radioactive waste and spent fuel in accordance with appropriate classification of the radioactive waste;

d. the concepts or plans and technical solutions for spent fuel and radioactive waste management from generation to disposal;

e. the concepts or plans for the post-closure period of a disposal facility's lifetime, including the period during which appropriate controls are retained and the means to be employed to preserve knowledge of that facility in the longer term;

f. the research, development and demonstration activities that are needed in order to implement solutions for the management of spent fuel and radioactive waste;

g. the responsibility for the implementation of the national programme and the key performance indicators to monitor progress towards implementation;

h. an assessment of the national programme costs and the underlying basis and hypotheses for that assessment, which must include a profile over time;

i. the financing scheme(s) in force;

j. a transparency policy or process as referred to in Article 10;

k. if any, the agreement(s) concluded with a Member State or a third country on management of spent fuel or radioactive waste, including on the use of disposal facilities.

12.2. The national programme together with the national policy may be contained in a single document or in a number of documents.

12.1 Inventory of all spent fuel and radioactive waste

The waste inventory appears in the national programme and is summarised in the Annex to this report.

12.2 National programme

The national programme is published separately to this national report and among other things describes the national policy in respect of the management of spent fuel and radioactive waste. It will be published as a single document, without separate annexes. Background documents on which the national programme is based are not part of the national programme.

Annex Waste inventory

A.1 Introduction

The waste inventory and the background to that inventory appear in the national programme document and elsewhere. The background is briefly explained below.

Broadly speaking, it can be argued that the IAEA- categories High Level Waste (HLW) and Intermediate Level Waste (ILW) match the Dutch category 'Hoog Radioactief Afval' (HRA) and the IAEA categories Low Level Waste (LLW) and Very Low Level Waste (VLLW) match the Dutch category 'Laag en Middel Radioactief Afval' (LMRA).

In the Netherlands, so-called NORM waste (Naturally Occurring Radioactive Material) is identified as a separate category from LMRA. The report below refers to LMRA excluding NORM waste.

A.2. Current volumes of spent fuel and radioactive waste

The volumes stored at COVRA as at 31 December 2013 were:

HRA Present as spent fuel, consumed uranium targets for isotope production and other HRA	86 m^3
LMRA (excluding NORM)	11000 m^3
NORM	17000 m^3

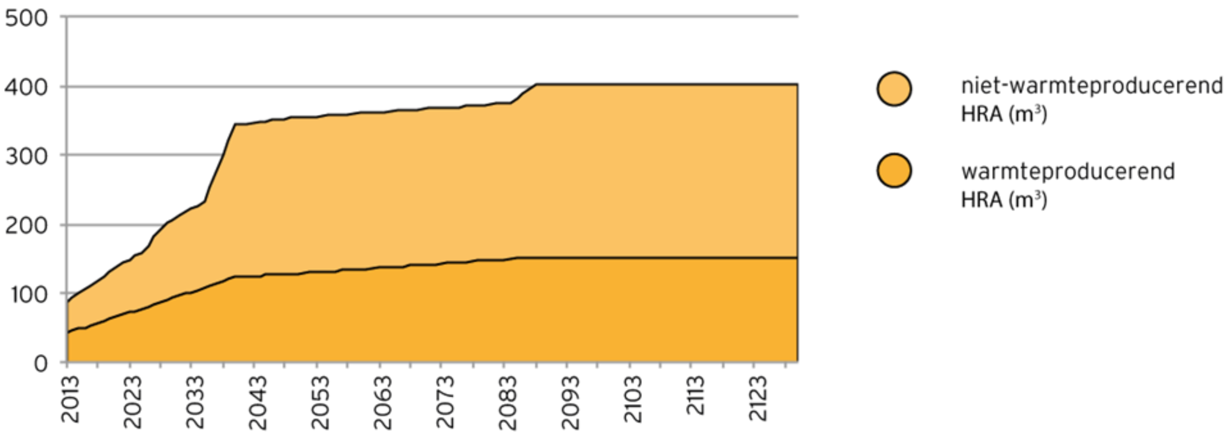
A.3. Development of the volume of stored spent fuel and radioactive waste

The trends below are based on interviews with waste generators, date from dismantling plans and extrapolation from the current supply of radioactive waste. The estimate is also based on the current exemption and release standards. If these standards change, this could have consequences for the estimated volume.

HRA

The volume of HRA in 2130 is estimated at 400 m^3 (see Figure 2). Of this total, almost two thirds will be non-heat producing waste with more than one third heat producing.

One uncertainty that affects the volume of HRA is the presence of operational nuclear installations in the Netherlands. In drawing up the inventory, account was taken of the closure of the nuclear power plant in Borssele in 2033 and dismantling in the subsequent decades, and the construction of a research reactor in Petten (Pallas). Following closure and decommissioning of the Borssele nuclear power plant, the supply of HRA will fall considerably.



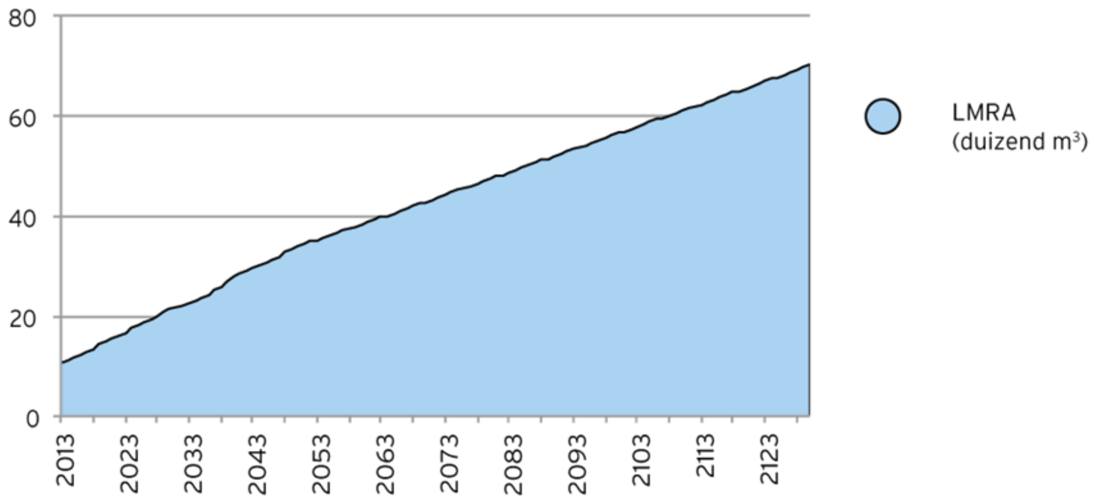
Non-heat producing waste (m^3)

heat producing waste (m^3)

Figure 2 Development of the volume of HRA through to 2130

LMRA

The volume of LMRA in 2130 is estimated at 70,000 m^3 (see Figure 3). Of this total, approximately two thirds will decay over the next one hundred years to below the release thresholds. Decayed waste can be disposed of as conventional waste, and need not be placed in the disposal facility.

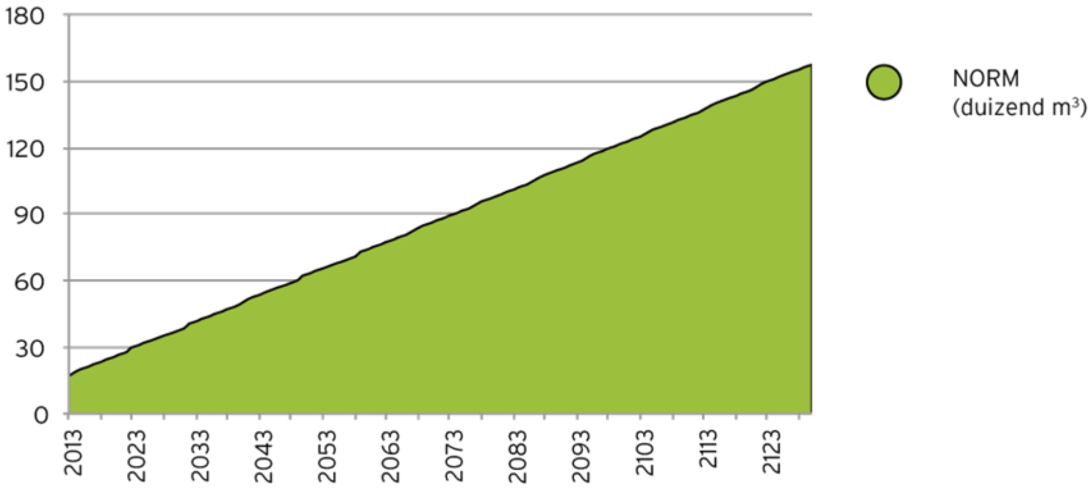


LMRA (thousand m^3)

Figure 3 Development of the volume of LMRA through to 2130

NORM

The volume of NORM waste in 2130 is estimated at 158,000 m^3 (see Figure 4). Because of these large volumes, minor changes to legislation and regulations could result in major fluctuations in the volume of NORM waste. Current production is extrapolated to the future.



NORM (thousand m^3)

Figure 4 Development of the stored volume of NORM at COVRA through to 2130

Authority for Nuclear Safety and Radiation Protection

Postbus 16001 | 2500 BA Den Haag
+31 70 348 74 27

www.anvs.nl

May, 2016